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EXAMINER
CRAIG, DWIN M

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

<table>
<tr><td rowspan="2" style="text-align:center;vertical-align:middle;">Office Action Summary</td><td>Application No.</td><td>Applicant(s)</td><td></td></tr>
<tr><td>10/802,624</td><td>WILLIAMS ET AL.</td><td></td></tr>
<tr><td>Examiner</td><td>Art Unit</td><td></td></tr>
<tr><td>Dwin M. Craig</td><td>2123</td><td></td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 May 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-26</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-26</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   Office Action Summary   Part of Paper No./Mail Date 20070716

DETAILED ACTION

1.   Claims 1-26 have been presented for reconsideration based on Applicants' amended

claim language and arguments.

Response to Arguments

2.   Applicants' arguments presented in the 5/8/2007 responses have been fully considered;

the Examiner's response is as follows:

2.1   The Examiner thanks the Applicants' for amending the specification and hereby

withdraws the objection to the same.

2.2   Regarding the Applicants' response to the 35 U.S.C. 101 rejections of claims 1-26, the

Examiner has found Applicants' instant amendments to the claims to have provided a concrete,

useful and tangible result as required by 35 U.S.C. 101, more specifically the Examiner notes

that on page 2 lines 5-10 of the specification is clearly disclosed that the claimed process of

modeling a complex *physical* system provides a *real-world* useful result. The earlier applied 35

U.S.C. 101 rejections of claims 1-26 have been withdrawn.

2.3   Regarding Applicants' arguments regarding the 35 U.S.C. 103(a) rejections of claims 1-

26, Applicants' have merely provided a description of what subject material was presented in the

cited U.S. Patent 5,696,885 to *Hekmatpour* then followed with an opinion that *Hekmatpour* fails

to disclose or suggest the newly amended limitations in the claims. Applicants' arguments fail to

comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define

a patentable invention without specifically pointing out how the language of the claims

patentably distinguishes them from the references.

For example on page 12 of the 5/8/2007 responses Applicants' opined that, *Hekmatpour does not teach or suggest "...determining whether a third node used to represent an operation represents the first operation; and based on the determining, modifying a cost associated with the second operation..."* This is just a recitation of the newly amended claim limitations from claim 1 and fails to disclose to specifically point out how the cited reference *Hekmatpour* fails to teach or suggest the claimed subject matter. *Hekmatpour* provides a teaching of a *tree based analysis* expert system which has costs associated to each node of the tree, Applicants' newly amended claim limitation could be interpreted to mean that when the tree structure is analyzed the different nodes, *in this case node 3 and node 1,* or *a node one level down on the tree versus a node three levels down,* contain the same datum and are thus redundant and therefore need to be pruned, modified or removed. Col. 17 lines 25-46 of *Kematpour* teaches the process that occurs when different nodes are analyzed; a determination is made that the other nodes are effected, more specifically, "...The algorithm then solves each intermediate sub-problem using the final state of one sub-problem as the initial state for the next sub-problem..." in other words if the third node is a *intermediate sub-problem* and the first node is the *initial state* of the parent node, then the cost associated with this *sub-problem* third node, using the initial state of the next sub-problem in other words the state of the *third node* or *intermediate* ends up effecting the processing of the *first node* or the *final state of one sub-problem.* Therefore the *Kematpour* still teaches the claimed limitations as set forth in the newly amended claim language. It is noted by the Examiner that the newly amended claims have changed the scope of the previously claimed subject matter.

Applicants' arguments have been unpersuasive and the previously applied prior art

rejection will be maintained.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3.   Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

3.1   Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for

omitting essential structural cooperative relationships of elements, such omission amounting to a

gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural

cooperative relationships are: using independent claim 1 as an example; while the preamble of

the claim is stating that an analysis is being performed the remaining steps as recited in the claim

fail to perform an analysis and therefore the claimed limitations are disjoint and there is no

connection between the preamble and the body of the claim.

3.2   Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for

omitting essential steps, such omission amounting to a gap between the steps. See MPEP

§ 2172.01. The omitted steps are: setting a cost associated with an operation, using independent

claim 1 as an example, the amended claim discloses, *based on the determining, modifying a cost*

associated with the second operation, it is unclear how a cost can be modified before that cost is

initially set, in other words there is no step where the cost for the *second operation* is initialized

and therefore how can a cost be modified without first initializing the cost to a specific value.

As an example, claims 12 and 21 has been amended to add the limitation, *the model

further configured to determine whether a third node used to represent an operation represent

the first operation, and based on the determination, to modify a cost associated with the second

operation.* No where in the preceding method steps is a cost been set on any of the nodes of the

tree so the cost after the determining step cannot be *modified* unless it was first initialized in a

preceding method step, while the claim language appears to be a description of a model, this

particular portion of the claim language appears to be presented as a method step, further an in

regards to the claim 12 describing components of a model, while the current claim language

describes, *a complex physical system involving a plurality of cost-incurring operations

associated with the system*, it is unclear from the current claim language if each node has a cost

associated with it. Therefore, it is unclear as regarding how the cost is being modified, if it was

never set to a predetermined level.

Regarding claims 23 and 25 while the claim language appears to be teaching a computer

system or computer for modeling costs and the claims also appear to include method steps, for

example in claim 25 there is the limitation, *reduce one or more costs associated with the second

and third nodes.* The costs of being associated with the second and third nodes were never

initialized nor was there a descriptive element disclosed that that stated that each node had a cost,

in the preamble of the claims is stated, *a complex physical system having a plurality of cost-

incurring operations associated with the system,* and yet there is method step attributed to the

processor component of the *system* which contains a claim limitation whereby there are costs

being associated with the *second and third nodes,* therefore it is unclear if the costs are

associated with the *operations* or the claimed *nodes* of the claimed *tree structure.*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

The text of those sections of Title 35, U.S. Code not included in this action can be found

in a prior Office action.

The factual inquiries set forth in *Graham* v. *John Deere Co.,* 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the

claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c)

and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4.   Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent

5,696,885 to Hekmatpour.

4.1   Regarding independent claim 1, Hekmatpour teaches or makes obvious, *a method of*

analyzing the ownership costs of a complex physical system (see Figure 10 and Col. 12 lines 10-

13 "Assign a node cost (NC) to each node representing the relative cost (dollar, time, manpower,

resources) or performing, testing, or verifying the conditions, tests, and actions described at the

node..." see also Col. 10 lines 4-57) *involving a plurality of cost-incurring operations associated*

with the components of the system, (see Col. 4 lines 38-54 which describes a *complex system* this

complex system contains components Figure 17 discloses a mechanical "ARM" which is a

physical component of a system) *the method comprising: using a first and a second node of a*

tree structure (Figure 3 item # 26 and Figure(s) 6-9) *to represent a first and a second operation*

associated with the system; (Col. 4 lines 55-67 more specifically, "An uppermost level comprises

behavioral knowledge level, a middle level comprises structural knowledge..." see also figure 7)

using a branch of the tree structure to represent a first dependency between the first operation

and the second operation; (Figure 7 teaches a dependency between the different *levels* using the

lines, further leaf nodes are dependent upon parent nodes in tree structures, see also the

discussion in Col. 16 lines 4-67 and Col. 17 lines 1-25 see also Col. 12 lines 1-5 more

specifically "...the condition under which the <u>branch</u> is valid..."), *Hekmatpour* provides a

teaching of a *tree based* analysis expert system which has costs associated to each node of the

tree, Applicants' newly amended claim limitation could be interpreted to mean that when the tree

structure is analyzed the different nodes, *in this case node 3 and node 1,* or *a node one level*

down on the tree versus a node three levels down, contain the same datum and are thus redundant

and therefore need to be pruned. Col. 17 lines 25-46 of *Kematpour* teaches the process that

occurs when different nodes are analyzed; a determination is made that the other nodes are

effected, more specifically, "...The algorithm then solves each intermediate sub-problem using

the final state of one sub-problem as the initial state for the next sub-problem..." in other words

if the third node is a *intermediate sub-problem* and the first node is the *initial state* of the parent

node, then the cost associated with this *sub-problem* third node, using the initial state of the next

sub-problem in other words the state of the *third node* or *intermediate* ends up effecting the

processing of the *first node* or the *final state of one sub-problem*,

and determining whether a third node used to represent an operation and based on the
determining, modifying a cost associated with the second operation claim interpretation, the

examiner is interpreting the claim language to mean that there is a check to see if the third node

contains the solution to the problem, Hekmatpour teaches traversing a tree to the third level,

where there will be a node, in order to find a solution to a problem (Col. 17 lines 15-25 and

Figures 1a-1c) and regarding the modifying of the cost of the second operation, see (Col. 12 lines

10-14).

At the time of the invention, it would have been obvious to a person of ordinary skill in

the art to have derived the specific technical details as disclosed in the claimed limitations set

forth in view of the teachings of Hekmatpour. The suggestion for doing so would have been to

provide for a method of passing on experience and expertise to new employees without the

employees having to attend a standardized training course, this methodology provides for a low

cost method of training new employees without having to burden existing employees for training

as well as providing a self paced or *just in time* learning environment for greater efficiency and lower cost see Hekmatpour Col. 3 lines 45-67 and Col. 4 lines 1-5.

Therefore, it would have been obvious to use the teachings of Hekmatpour to obtain the invention as specified in claims 1-26.

4.2 Regarding claim 2, Hekmatpour teaches, *further comprising associating a cost with the first node, the cost to be further associated with the first operation* (Col. 18 lines 35-57 more specifically "Given node strength NS_{ij} and <u>node cost</u> NC_{ij} " and see Col. 12 lines 10-13 "Assign a node cost (NC) to each node representing the relative cost (dollar, time, manpower, resources) or performing, testing, or verifying the conditions, tests, and actions described at the node...").

4.3 Regarding claim 3, Hekmatpour substantially teaches or makes obvious, *determining a total cost associated with the first and the second operations including the cost associated with the first operation* (Col. 18 lines 35-57 more specifically "Given node strength NS_{ij} and <u>node cost</u> NC_{ij} " and see Col. 12 lines 10-13 "Assign a node cost (NC) to each node representing the relative cost (dollar, time, manpower, resources) or performing, testing, or verifying the conditions, tests, and actions described at the node...").

4.4 Regarding claim 4, Hekmatpour substantially teaches or makes obvious, *modifying the first node to represent a change of the first operation* (Col. 12 lines 17-59 more specifically, "Can the value of a node attribute change during diagnosis or is it fixed once assigned?" which substantially teaches modifying a *first* node to represent a change or the first operation).

4.5 Regarding claim 5, Hekmatpour substantially teaches or suggests, *further comprising disabling modifications to the second node* (Col. 13 lines 51-64 more specifically "...the

resultant tree is saved in memory…and processing terminates" which is the functional equivalent of disabling modifications).

4.6 Regarding claim 6, Hekmatpour substantially teaches or suggests, *further comprising undoing the modification to the first node and enabling a subsequent modification* (Col. 12 lines 17-59 more specifically, "Can the value of a node attribute change during diagnosis or is it fixed once assigned?" which substantially teaches modifying a *first* node to represent a change or the first operation).

4.7 Regarding claim 7, Hekmatpour substantially teaches or suggests *further comprising subsequently modifying the second node to reflect a change of the second operation* (Col. 12 lines 17-59 more specifically, "Can the value of a node attribute change during diagnosis or is it fixed once assigned?" which substantially teaches modifying a *second* node to represent a change or the second operation).

4.8 Regarding claim 8, Hekmatpour substantially teaches or suggests *modifying the first node further comprising modifying the first dependency* (Col. 13 lines 35-64 defining root nodes is the functional equivalent of *modifying*).

4.9 Regarding claim 9, Hekmatpour substantially teaches or suggests *further comprising determining whether a second branch branches from the first node, the first branch branching from the first node* (see Figure(s) 6-9 and Col. 12 lines 1-5 more specifically "…the condition under which the branch is valid…").

4.10 Regarding claim 10, see the rejection of claim 1 above which substantially teaches the claimed subject matter.

4.11   Regarding claim 11, Hekmatpour substantially teaches or suggests *further comprising*

determining whether a third node represents the first operation (Figure 9 teaches a third node,

see also, Col. 7 lines 1-3).

4.12   Regarding claim 12, Hekmatpour substantially teaches or suggests, *a cost model for a*

complex system to have a plurality of operations associated with the system, (see Figure 10 and

Col. 12 lines 10-13 "Assign a node cost (NC) to each node representing the relative cost (dollar,

time, manpower, resources) or performing, testing, or verifying the conditions, tests, and actions

described at the node..." see also Col. 10 lines 4-57) *the model comprising: a tree*

structure;(Figure 7) *a first node representing a first operation associated with the system;*

(Figure 9 item labeled N_0) *a second node representing a second operation associated with the*

system; (see Figure 2b and Col. 4 lines 55-67 more specifically, "An uppermost level comprises

behavioral knowledge level, a middle level comprises structural knowledge..." see also figure 7)

a branch branching from the first node representing a first dependency between the first and the

second operations;(Figure 1c and the descriptive text more specifically Col. 16 lines 20-40 and

Figure 9) *and a function determining whether a third node represents the first operation.* (Figure

9 teaches a third node, see also, Col. 7 lines 1-3), regarding the teaching of a computer readable

medium, see (Figure 11 and Col. 20 lines 20-31) further and in regards to the newly amended

claim limitation, *the model further configured to determine whether a third node used to*

represent an operation represent the first operation, and based on the determination, to modify a

cost associated with the second operation.

4.13   Regarding claim 13, Hekmatpour substantially teaches or suggests *further comprising a*

cost associated with the first node, the cost to be further associated with the first operation (see

Col. 12 lines 10-13 "Assign a node cost (NC) to each node representing the relative cost (dollar, time, manpower, resources) or performing, testing, or verifying the conditions, tests, and actions described at the node...").

4.14 Regarding claim 14, Hekmatpour substantially teaches or suggests *a total cost associated with the first and the second operations including the cost associated with the first operation* (see Col. 12 lines 10-13 "Assign a node cost (NC) to each node representing the relative cost (dollar, time, manpower, resources) or performing, testing, or verifying the conditions, tests, and actions described at the node...").

4.15 Regarding claim 15, Hekmatpour substantially teaches or suggests *wherein the first node may be modified to represent a change of the first operation* (Col. 12 lines 17-59 more specifically, "Can the value of a node attribute change during diagnosis or is it fixed once assigned?" which substantially teaches modifying a *second* node to represent a change or the second operation).

4.16 Regarding claim 16, Hekmatpour substantially teaches or suggests *further comprising a function to disable modifications to the second node if a modification has been made to the first node* (Col. 13 lines 51-64 more specifically "...the resultant tree is saved in memory...and processing terminates" which is the functional equivalent of disabling modifications).

4.17 Regarding claim 17, Hekmatpour substantially teaches or suggests *further comprising a function to undo the modification to the first node and to enable a subsequent modification* (Figure(s) 4 & 5 and Col. 6 lines 48-58 and Col. 13 lines 50-67 and Col 14 lines 22 the ability to define and edit the knowledge system suggests the ability to *undo* a modification).

4.18   Regarding claim 18, Hekmatpour substantially teaches or suggests *wherein the second*

node may be modified to represent a change in the second operation (Figure(s) 4 & 5 and Col. 6

lines 48-58 and Col. 13 lines 50-67 and Col 14 lines 22 the ability to define and change a node

and there are *second* nodes see Figure(s) 6-9).

4.19   Regarding claim 19, Hekmatpour substantially teaches or suggests *the changing the first*

node further comprising modifying the first dependency (Figures 8 & 9 clearly teach .

dependencies between the nodes).

4.20   Regarding claims 20, Hekmatpour substantially teaches or suggests *further comprising a*

function to determine whether a second branch branches from the first node, the first branch

branching from the first node (see Figure(s) 6-9 and Col. 12 lines 1-5 more specifically "...the

condition under which the <u>branch</u> is valid...").

4.21   Regarding claim 21, see the rejection of claim 12 above.

4.22   Regarding claim 22, see the rejection of claim 12 above.

4.23   Regarding claim 23, the rejection of claim 12 above substantially teaches the claim with

the exception of the following limitations: *a memory to store a tree structure and an output to*

output a result of the determination.

Hekmatpour substantially teaches *a memory to store a tree structure* (Col. 34 lines 12-15

and Col. 5 lines 18-33 "having a memory means") *and an output to output a result of the*

determination (Figure(s) 11 and Col. 7 lines 7-10) and as regards the limitation of *a graphical*

user interface configured to display the reduced costs, Hekmatpour discloses the use of a GUI

(Figure 25 and the descriptive text) and regarding the newly amended limitation for *a processor*

configured to determine whether a third node used to represent an operation see Figure 14 and the descriptive text.

4.24   Regarding claim 24, Hekmatpour substantially teaches, *wherein the processor to further determine whether a second branch branches from the first node, the first branch branching from the first node* (Figure(s) 1a-1c and 4-9 and the descriptive text).

4.25   Regarding claim 25, see the rejection of claim 24 above as regards the limitation of *a graphical user interface configured to display the reduced costs*, Hekmatpour discloses the use of a GUI (Figure 25 and the descriptive text) and regarding the newly amended limitations, *between the first node and a third node represents a dependency of the first operation on a third operation represented by the third node, and based on the determining reduce one or more costs associated with the second and third nodes*, see (Figure 14 and the descriptive text, regarding costs see Col. 12 lines 10-15).

4.26   Regarding claim 26, see the rejection of claim 12 above and regarding a forth node see (Figure 7 and the descriptive text).

Conclusion

5.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after
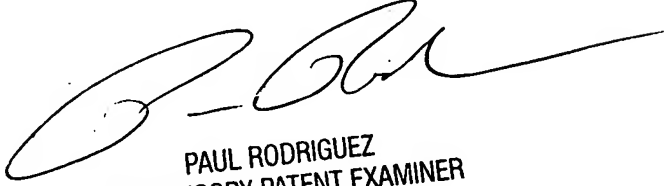
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5.1   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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